

# USER- MANUAL

## Thermometer TT-3



## Tamson Instruments bv



est. 1878

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## 1 SAFETY AND WARNINGS

Make sure before installing or operating the equipment to read and understand all instructions and safety precautions listed in this manual. If there are any questions concerning the operation of the equipment or about the information given in this manual please contact your local dealer or our sales department first.

Performance of installation, operation, or maintenance other than those described in this manual may result in a hazardous situation and may void the manufacturer's warranty.

Never operate equipment that is not correctly installed. Unqualified personnel must not operate the equipment. Avoid damage to the equipment, or its accessories, caused by incorrect operation.

Important:

- When performing service, maintenance or moving the apparatus, always disconnect the apparatus at the main's socket,
- Proper skilled and trained personnel are only allowed to operate this equipment,
- Take notice of warning labels and never remove them,
- Refer service and repairs to qualified technician,
- If a problem persists, call your supplier or Tamson Instruments b.v.

## 2 WARRANTY

Tamson Instruments b.v. warrants that all their manufactured equipment is free from defects in material and workmanship, preventing the device from normal operation. Tamson Instruments b.v. does not warranty that the equipment is fit for any other use than stated in this manual. The manufacturer can only be held responsible for the security, reliability and performance of the equipment, when operated in accordance with the operating instructions, extensions, adjustments, changes and/or if repair is performed by Tamson Instruments b.v. or authorized persons only. This warranty is limited to one year from the date of invoicing. All equipment and materials are subject to standard production tolerances and variations.

## 3 Disclaimer

For relevant measurements always an independent reference measurement is needed. Tamson can not be held responsible for misinterpretation or consequences of an erroneous reading

## 4 PRECAUTIONS AND HAZARDS

**Before attempting to operate the thermometer read all parts of this manual carefully to insure smooth operation and avoid damage to the equipment or its accessories.**

If a malfunction occurs, consult section "Trouble shooting", page 17. If the problem persists email at [service@tamson.com](mailto:service@tamson.com). Never operate the equipment if not correctly installed. The equipment must be operated only by qualified personnel. Avoid damage to the equipment or its accessories through incorrect operation.



## 5 INSTALLATION

### 5.1 Important

Tamson Instruments bv is not responsible for any consequential damage or harm caused by using this thermometer. Repairs on the electrical system of the thermometer may only be carried out by well trained and authorized persons.

### 5.2 Unpacking

Before leaving the factory Tamson products are adequately packed to prevent damage during normal transportation. Check the packing for external damage and make a note on the shipping documents if any damage is found. Always retain the cartons and packing material until the product has been tested and found in good condition. (Transport companies generally will not honor a claim for damage if the respective packing material is not available for examination).

## 6 Use

The thermometer is a sensitive measuring device.

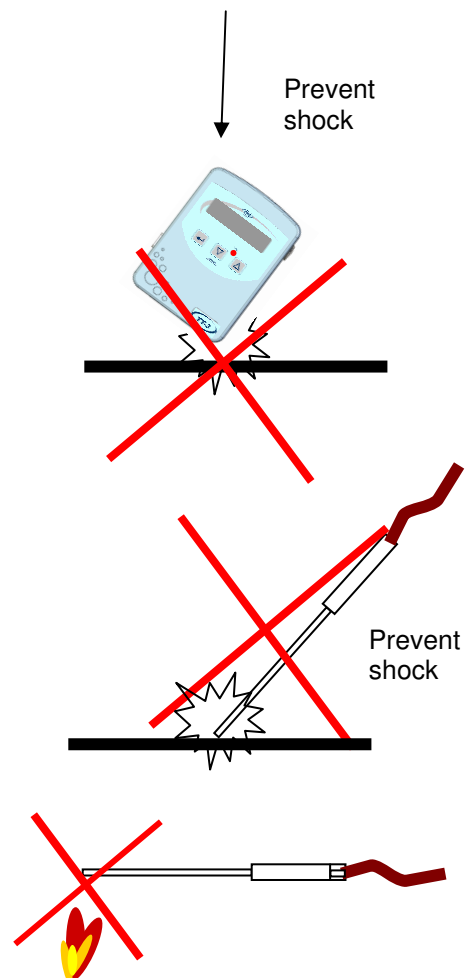
Prevent shock from the thermometer body or sensor.

Do not drop the thermometer housing.

Do not drop the thermometer sensor / probe.

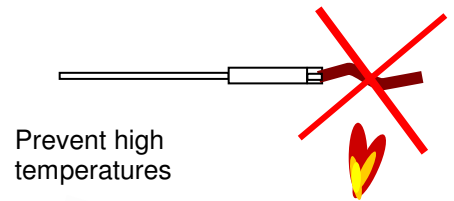
The thermometer housing is of thermoplastic and sensitive to heat. Prevent operating the thermometer at temperatures higher than 50°C.

The temperature sensor is of stainless steel. Prevent temperatures higher than 250°C at the tip of the sensor.

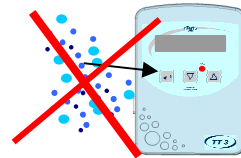


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The temperature sensor has silicone wire. Prevent temperatures higher than 200°C.



Keep the thermometer away from water.



Keep the serial connector and sensor connector (PT100) away from water. Corrosion of the PT100 connector will seriously influence the calibration.



Keep sensor attached to thermometer.  
Calibration will be influenced by corrosion of contacts over time if not connected.

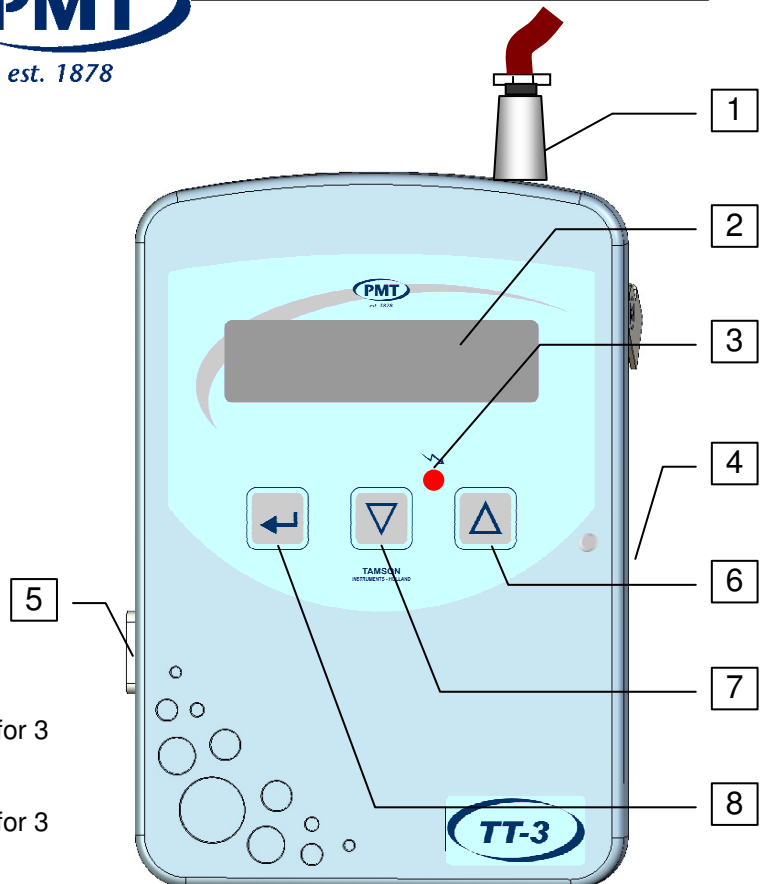
Keep sensor attached



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## 7 What is what

- 1 Connector temperature sensor
- 2 Display
- 3 Battery charge indicator
- 4 Connector wall socket
- 5 RS232
- 6 Key: Up
- 7 Key: Down
- 8 Key: Enter and on/off



### 7.1 Start

Switch the thermometer on, press the enter key for 3 seconds.

Switch the thermometer off, press the enter key for 3 seconds.

When switched on the thermometer will display the temperature.

### 7.2 Menu structure

When switched on, select settings using the up key:

#### 7.2.1 Logging

Log on or log off

Press enter, and select with up and down key to toggle logging. Confirm by pressing enter. Make sure, when logging is on, a "L" is displayed on right side of display.

The Thermometer will store the temperature reading taken at each interval selected at log time.

With the TAMCOM program the stored data can be retrieved from the Thermometer.

#### 7.2.2 Log time

Press enter, and select appropriate logging time: 1,2,5,10,30,60,120 or 300 seconds

At each interval a sample of the temperature is taken and stored with a time stamp in memory.

After the value "300 sec." the option erase becomes available. When selected by pressing enter, the internal



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memory is erased. This takes a few seconds and "Erasing..." is displayed.

### **7.2.3 Alarm low** Optional

### **7.2.4 Alarm high** Optional

### **7.2.5 Units**

Select enter and toggle for degree F or degree C. The output format of the RS232 will be the same as the displayed temperature. When degree C is selected, the RS232 will output the temperature in degrees C. When degrees F are displayed, the RS232 format will be in degrees F.

### **7.2.6 Baudrate**

9600  
19.2K  
38K4  
**57K6**  
115.2K  
230.4K

When using the free available software Tamcom use setting 57K6

Tamcom(2) can be downloaded from our internet site [www.tamson.com](http://www.tamson.com) under downloads. Also see the Tamcom manual how to install and operate the software.

When using longer cables a lower baudrate must be selected. A higher baudrate means faster transmission, but can lead to transmission problems. The 57K6 mode is advised to use up to 3 meters of cable length.

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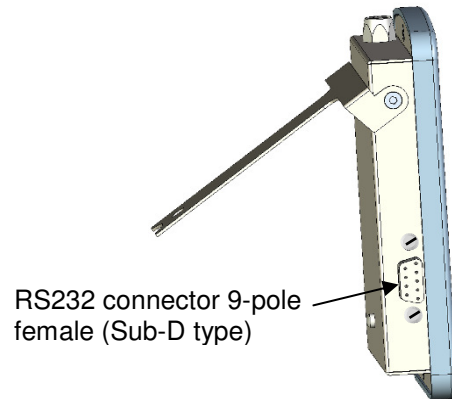
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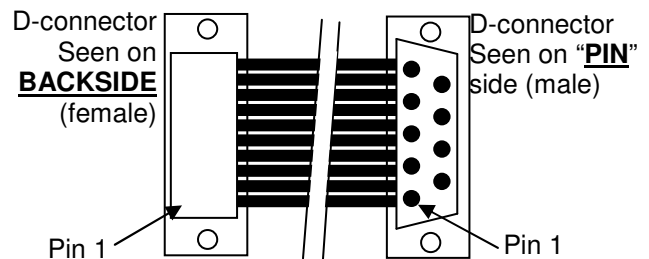
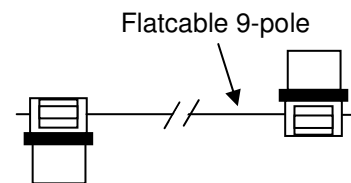
## 8 Communication

### 8.1 Hardware setup

On the left side a female connector is available on the thermometer.



Following cable can be used for communication.  
It is a 1 : 1 connection



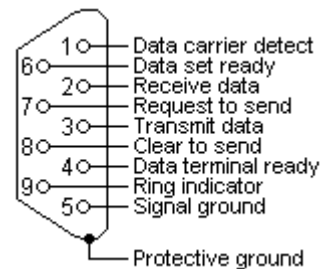
It also is possible to only use three wires. Only transmit, receive and ground are used:

Connect pin 2 to pin2 (male - female sub-D connectors, receive)

Connect pin 3 to pin3 (male - female sub-D connectors, transmit)

Connect pin 5 to pin5 (male - female sub-D connectors, ground)

General connections for the 9 pole:



**If your computer has USB available use the RS232-USB converter.**

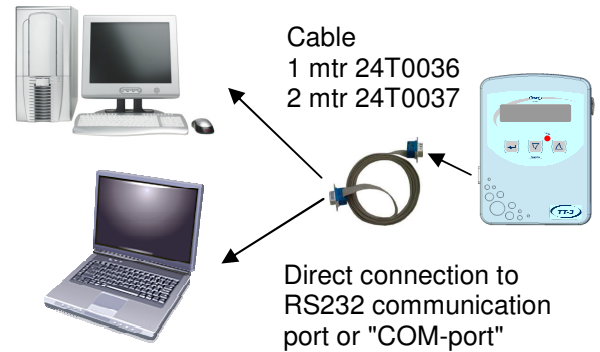


## 8.2 Software Tamcom(2)

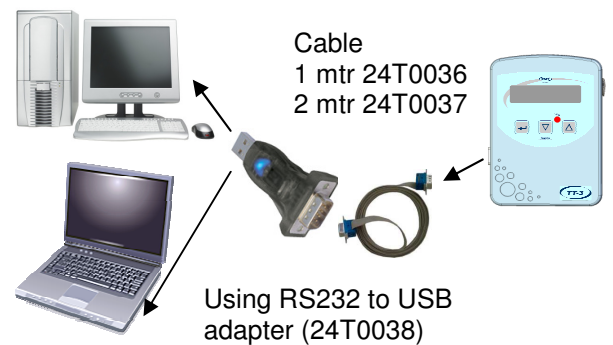
The Thermometer can be connected to a windows PC or laptop.

If the PC has a COM port available, the thermometer can be connected directly onto the PC or Laptop.

**Use a baudrate setting on the thermometer of 56.7K!**



If there is only USB available, the RS232 to USB converter must be used and installed 24T0038.

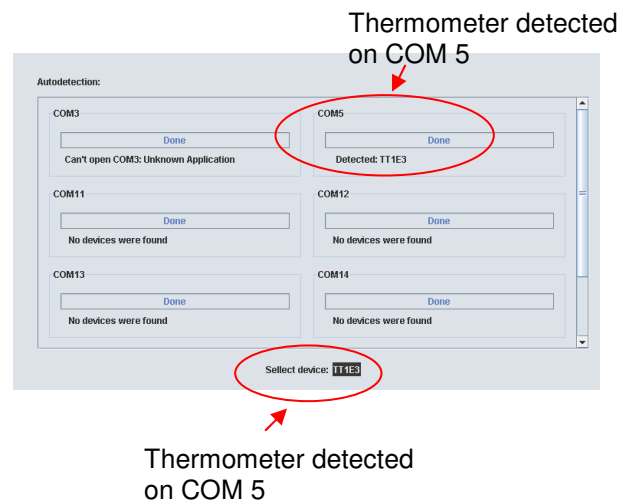


Install the Tamcom(2) program. To operate the Tamcom program, the Java software must be installed. In the Tamcom(2) manual the full installation is described including the Java Software. On most PC's Java already is operational and installed.

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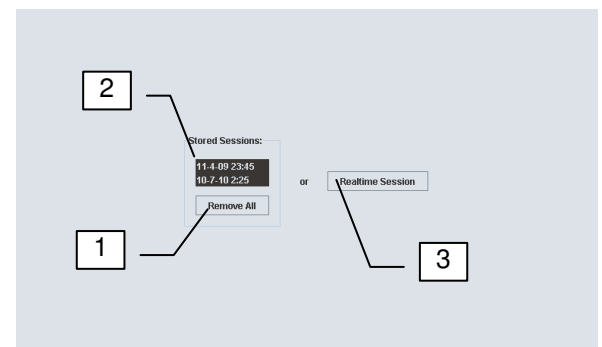
### 8.3 Starting Tamcom

When the Thermometer is connected and the Tamcom software is started, it will automatically find the Thermometer.



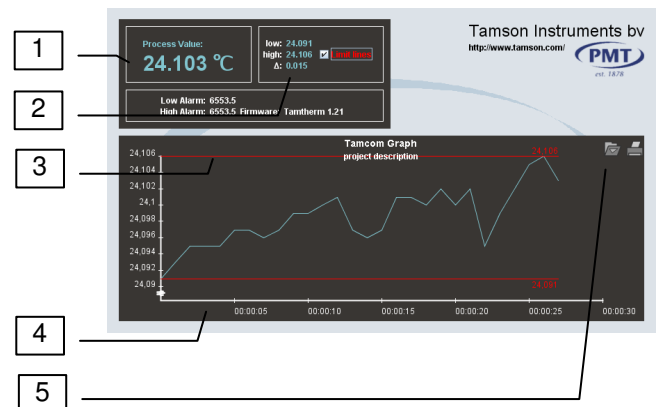
When detected, a list of measurements in memory is displayed. There are three options here:

- 1: Clear memory (remove all)
- 2: Select one of the measurements from memory. In this example click on "10-7-10 2:25" or "11-4-09 23:24" to load the measurement.
- 3: Display real time session.



#### 8.3.1 Real time session

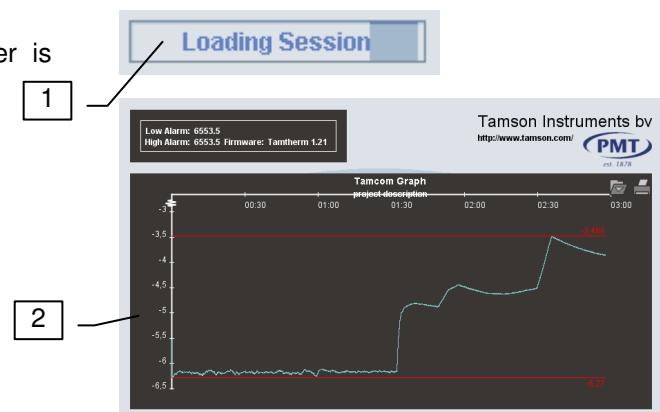
- 1 Temperature
- 2 Highest and lowest values
- 3 Delta measured
- 4 Toggle limit lines
- 5 Limit lines



#### 8.3.2 Stored session

When selected, data is loaded from memory. A timer is displayed (1).

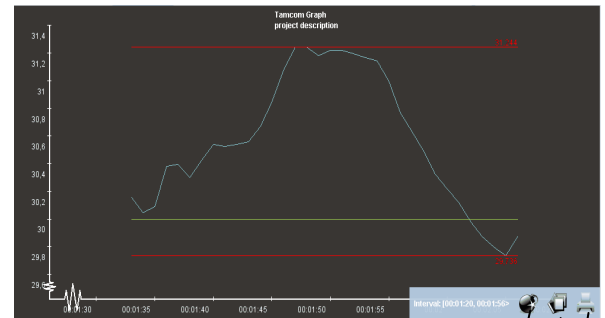
When ready the graph is displayed (2).



### 8.3.3 Zoom function

Use your right mouse button to select a specific part of the graph. Keep the button pressed and move button to the left or right. When released this part of the graph is zoomed in. Click the "bomb" icon to return to the full graph.

- 1 Return from zoom
- 2 Save data onto hard-disk
- 3 Print data



### 8.3.4 Saving data

Apart from printing the graph can be exported in "PNG" format (license free replacement for GIF format) and can be used in Microsoft Word. Also available is SVG (Scalable Vector Graphics).

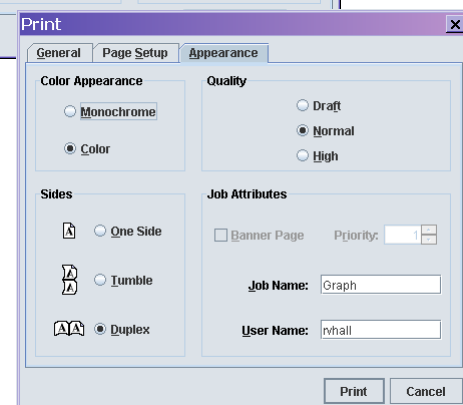
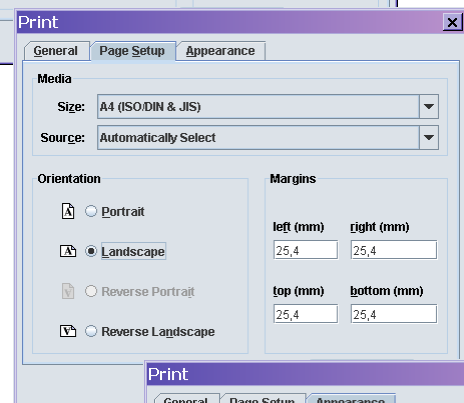
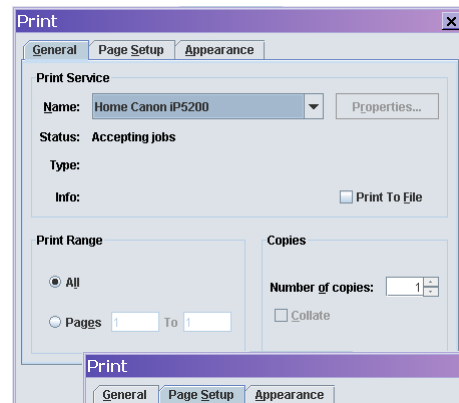
Export to a spreadsheet the data is available as CSV (comma separated value):

```
Time,Setpoint,Proces
Value
00:00,10,"23,863"
00:00:01,10,"23,878"
00:00:02,10,"23,889"
00:00:03,10,"23,892"
etc.
```

### 8.3.5 Printing data

Printing the graph using the print button (bottom left):

- And sub-menu "Page setup"
- And sub-menu "Appearance"



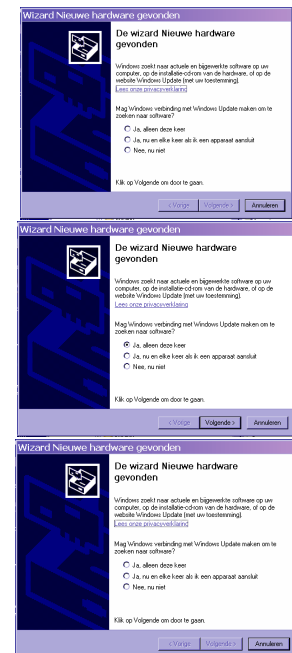
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## 8.4 Installing RS232 to USB converter

Unpack the adapter and plug the converter into an USB slot. In some cases the software is installed for this specific USB slot. The RS232 to USB converter will not work on another USB slot. When inserted to that slot it will again ask for installation. If installed both slots will work.

Windows will detect new hardware.  
Select to install this once.

Select to install the driver yourself.



Installation is in progress



Confirm that the software isn't digitally signed

Confirm installation

Sometimes it is necessary to perform the installation twice, as there might be one or more USB hub controllers. If windows asks to install for a second time this 2nd installation must be performed. It will not harm your system.



Necessary driver files for the USB to RS232 converter

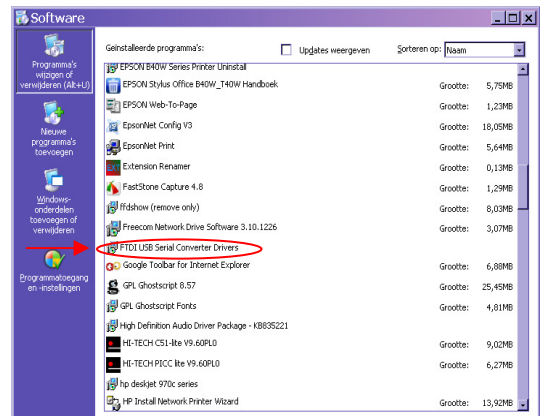
COMPORT.PDF	6 kB	10-4-2003 15:00
FTCOMMS.VXD	24 kB	20-10-2003 11:36
FTDIBUS.CAT	9 kB	10-4-2003 15:00
FTDIBUS.INF	4 kB	11-11-2003 10:37
ftdibus.sys	24 kB	11-11-2003 14:09
FTDIIPORT.CAT	8 kB	10-4-2003 15:00
FTDIIPORT.INF	5 kB	11-11-2003 10:37
FTDIUN2K.INI	1 kB	10-4-2003 15:00
FTDIUNIN.EXE	405 kB	10-4-2003 15:00
FTDIUNIN.INI	1 kB	10-4-2003 15:00
FTSENUM.SYS	25 kB	20-10-2003 11:36
FTSENUM.VXD	8 kB	20-10-2003 11:36
ftser2k.sys	57 kB	11-11-2003 14:09
FTSERIAL.SYS	69 kB	20-10-2003 11:36
FTSERMOU.INF	2 kB	30-10-2003 17:12
FTSERMOU.VXD	10 kB	10-4-2003 15:00
ftserui2.dll	48 kB	11-6-2003 12:48
FTSERUI.DLL	23 kB	20-5-2003 14:04
USB 2.0 TO RS232 Cable for Windows u...	183 kB	2-3-2004 14:57

## 8.5 Uninstall RS232 to USB converter

Use Start, configuration screen, software.

A list will be displayed.

Select the driver, FTDIUSB Serial Converter Drivers and perform an uninstall.



## 9 Battery

Charging the battery takes approximately 2hrs

On a full charge the thermometer is capable to work 16 days\* continuously.

**It is not recommended to operate the thermometer when connected permanently to the wall socket. This will shorten the battery lifetime**

When the battery runs empty, a battery sign is displayed. If this sign is displayed, connect the battery charger.

When the battery is being charged, the red LED on the front will light.

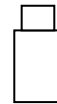
The LED is switched off when the battery is full.

If the battery is charged before the battery sign is displayed, less time is needed to charge the battery.

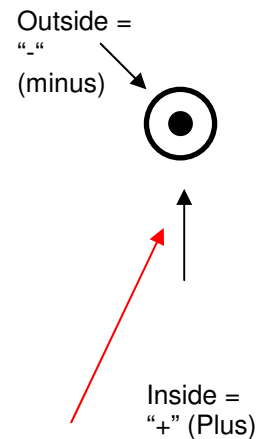
Do **not use a charger other than supplied**. Higher voltage or lower current supply seriously damage. This charger has following characteristics:

- 9V
- 600mA
- 100-240~50/60Hz
- Plug 2.0 .. 2.1 x 5mm

\* based on new battery



Battery sign,  
indicating low  
battery



Wall socket

## 10 Spare parts list

Ordering code	Image	Description
10T6096		Works certificate 0 .. +150°
10T6097		Works certificate -20 .. +150°
10T6098		Verification calibration per point [-20 .. +150°]
25T2350		Temperature probe -100..150 °C/-148..302 °F Cable length 1050mm Probe: A=115x6; B=100x6; C=215 [mm]; Class "a".
25T2351		Temperature probe -20..300 °C/-4..572 °F Cable length 1050mm Probe: A= 115x3; B=100x6; C=215 [mm] ; Class "a".
25T2352		Temperature probe -20..300 °C/-4..572 °F Cable length 1050mm Probe: A = 265x3 mm, B=100x6; C=365 [mm] ; Class "a".
24T0038		RS232 .. USB converter
24T0037		Cable 2mtr
24T0036		Cable 1mtr
24T0019		12V Adapter*
28T4185		Battery pack*

## 11 Dimensions

4. Dimensions			Remark
Length	147	[mm]	
Width	103	[mm]	
Height	32	[mm]	
Weight*	0.33	[kg]	
Power consumption			
Adapter	9V / 600mA		
Accuracy			
Resolution	0.001	[°C]	
Accuracy	±0.1	[°C]	Uncalibrated
Accuracy	±0.01	[°C]	With calibration
Linearity	±0.01	[°C]	
Temperature drift			
per year	0.001	[°C]	
per [°C] ambient	0.0005	[°C]	
Working condition (ambient)			
Temperature	20..30	[°C]	
Humidity	10..90	[%]	relative humidity
Sensor			See details spareparts. Sensors are optional. Due to specific calibration sensors are not interchangeable.



## 12 Trouble shooting

### 12.1 Display shows strange characters

Battery is below minimal operating voltage

Recharge the battery.

Press enter-key for 3..5 seconds to switch unit off.

Press enter key for 3..5 seconds to switch unit back on again.

### 12.2 Communication via RS232 gives problems

Cables too long

Use shorter cables, or lower baud rate.

Baudrate too high.

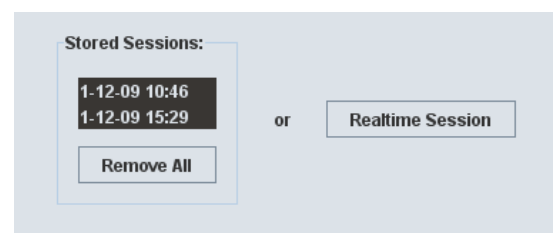
Use lower baudrate.

### 12.3 Can't load data in Tamcom

When opening Tamcom Stored Sessions is blank, though Thermometer shows that memory is used when selecting log on/off.

i.e. "Log Off 35% #2"

Try to restart Tamcom until datya is displayed



### 13 EC DECLARATION OF CONFORMITY THERMOMETER TT-3

Manufacturer: **Tamson Instruments BV**  
van 't Hoffstraat 12  
2665 JL Bleiswijk  
The Netherlands

Product: Thermostatic bath

Model: TT-3

The products to which this statement relates, is manufactured and dully carried out in compliance with the provisions of Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility.

The products are in conformity with the following specification:

Conducted emission	- EN55016-2-1 + EN61326+A1
Radiated emission	- EN55016-2-3 + EN61326+A1+A2+A3
ESD:	- EN61326 +A1+A2+A3 and EN61000-4-2 +A1+A2
Radiated immunity	- EN61000-4-3 +A1

January 2009, Tamson Instruments bv, The Netherlands

Ing. R.C. van Hall  
Director

**Tamson Instruments bv**